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10/813,843	03/31/2004	Nitzan Peleg	200311278-1	6064

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EXAMINER	
ROSE, HELENE ROBERTA	
ART UNIT	**PAPER NUMBER**
2163	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/813,843	PELEG ET AL.	
	Examiner	Art Unit	
	Helene Rose	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/31/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/31/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. Claims 1-22 have been presented for examination.

2. Claims 1-22 have been rejected

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 3/31/2004, accordingly, the information disclosure statement has been considered by the examiner.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Figure 1, does not include server 40, as described in applicants specification, paragraph [0020], line 5; Figure 4, has to diagrams labeled 160, which are the selection operator and delta values; wherein applicants specification within paragraph [0041], selection operator is labeled 169, wherein Figure 4, there is no diagram labeled 169, thus applicant is to look over all Figures, and diagrams have each diagram in accordance with the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claim 4 is objected to because of the following informalities: Claim 4 recites the following acronym "DCM". The following acronyms must be spelled out to fully indicate what they represent/stand for. Appropriate correction is required

Claim Rejections – 35 U.S.C – 112

6. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19, recite the limitation "**recited order**" renders the claim indefinite because neither the claim nor the specification explains what "**recited order**" means. It is difficult for the examiner to interpret the claim not knowing how the limitation "recited order" constitutes.

Claim Rejections 35 U.S.C – 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1-22 has been rejected under 35 U.S.C. 103(a) as being unpatentable over anticipated by Sun et al. (US Patent No. 5,963,959, Date of Patent: 10/5/1999) in view of Gupta et al. (US Patent No. 7,111,020, Filing Date: 3/26/2002).

Claim 1:

Regarding Claim 1, Sun teaches a system for performing refresh operations, the system comprising:

a base table having a first plurality of data entries (Figures 2A,B, C, diagram 200, Sun);

a first materialized view that comprises a second plurality of data entries, the second plurality of data entries being associated with the first plurality of data entries in the base table (Figures 2A,B, all features, wherein defined in column 4, lines 29-41, wherein a series of modifications a user might make to a master table and the corresponding entries recorded in a master log and master table 200 within FIG. 2(a) is a table of customer information including a column for a primary key CID, a customer identifier, and a column ZIP for a customer's ZIP code, wherein each row represents a particular customer, who is assigned a non-null, unique identifier, CID, wherein the corresponding master log 210 is empty and wherein master table 200 of FIG. 2(b) is the result of adding a new customer with a CID of 5 and a ZIP of 22046 to master table 200 of FIG. 2(a), wherein the primary key value of the inserted row, 5, is recorded in master log 210, Sun);

a refresh log that contains a plurality of changes in the base table (Figure 2C, wherein column 4, lines 42-49, the result of deleting the customer identified CID of 2 from the master table, the primary key value of 2 is stored as a new entry in master log, wherein if the zip code of customer CID of 4 in master table is changed from 22090 to 20190, then the master table is the result, the primary key value 4 of the updated row is stored as a new entry in master log, Sun); and

a module adapted to perform a refresh operation on the first materialized view using the second plurality of data entries, the module configured to (Figure 3, all features, wherein column 5, lines 10-15, the operation of a fast refresh mechanism, wherein the primary key values are selected from the master log which are not found in the master view the, the result of reissuing the snapshot definition query on the master table, Sun);

access the refresh log and the first materialized view (column 6, lines 65-66, wherein master table is accessed by the primary key values recorded in the master log, Sun);

calculate a plurality of delta values from the plurality of changes in the refresh log and the second plurality of data entries in the first materialized view (column 6, lines 43-45, wherein two new rows with column primary key, i.e. CID, of 5 and 6 are added, resulting in snapshot, diagram 400 within Figure 4e, Sun);

apply the plurality of delta values to the second plurality of data entries in the first materialized view (Figures 7A and B, all features, wherein defined in column 8, lines 52-67, Sun); and

provide the plurality of delta values to a delta adaptation module for updating a second materialized view (column 9, lines 27-49, Sun).

Claim 2:

Regarding Claim 2, Sun discloses all the limitations above. However, Sun does disclose a method a method of calculating (column 6, lines 43-45, wherein two new rows with column primary key, i.e. CID, of 5 and 6 are added, resulting in snapshot, diagram 400 within Figure 4e, Sun). Sun is silent with respect to wherein the delta calculation module and a delta processing module calculates the plurality of delta values and the delta processing module directs a plurality

of operators based on the operators. On the other hand, Gupta discloses wherein a delta calculation module ("DCM") and a delta processing module ("DPM") in the module, wherein the DCM calculates the plurality of delta values and the DPM directs a plurality of operators based upon the plurality of delta values (column 2, lines 31-36; column 3, lines 51-57; and column 5, lines 61-67, Gupta).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to incorporate a method for calculating and management of a database system by Gupta within Sun system to provide faster execution to reduce costly operations, and to improve the system performance.

Claim 3:

Regarding Claim 3, the combination of Sun in view of Gupta teaches wherein the first plurality of data entries and the second plurality of data entries each include one of a plurality of grouping identifiers that associate each of the first plurality of data entries with the second plurality of data entries (Figures 2A,B, and C, all features, wherein 2A, illustrates a plurality of data entries, and Figure 2B, illustrates another second plurality of data entries, and Figure 2C, diagram 210, illustrates a plurality of CID, i.e. column for primary key, which is equivalent to group identifiers, which is associated with Figures 2A, and B, which are the first and second data entries, Sun).

Claim 4:

Regarding Claim 4, the combination of Sun in view of Gupta teaches wherein the DCM utilizes the plurality of group identifiers to combine the second plurality of data entries with the

plurality of changes (Figures 1A and 1B, all features, Gupta).

Claim 5:

Regarding Claim 5, Sun teaches wherein the second plurality of data entries each comprises a grouping field and a count field (Figure 6C, contains a CID, equivalent to a group field and Time$$ which is equivalent to count field, wherein it's a value that is added, wherein clarified in column 7, lines 51-58, Sun).

Claim 6:

Regarding Claim 6, Sun in view of Gupta teaches a system for performing a pipelined refresh, the system comprising:

a first materialized view derived at least partially from a base table (Figure 1B, diagram 142, Gupta);

a refresh log having a plurality of entries, each of the plurality of entries corresponding to a change in the base table (Refer to claim 1, wherein this limitation has already been addressed, Sun), a second materialized view derived at least partially from the first materialized view (Figure 1B, diagram 144, Gupta);

a refresh module that comprises;

a first delta calculation module that calculates a plurality of delta values that represents the changes to the first materialized view (column 2, lines 31-36, Gupta);

a first delta-processing module that applies the plurality of delta values to the first materialized view (column 2, lines 37-41, Gupta);

a delta adaptation module that receives the plurality of delta values from the first delta calculation module and calculates a plurality of changes to the second materialized view (column 3, lines 51-57, Gupta);

a second delta calculation module that obtains the plurality of changes to the second materialized view from the delta adaptation module (Figure 4B-1 and 2, and 4C-1 and 2, all features, wherein it illustrates a log used to track changes to base tables for an incremental refresh mechanism, Gupta); and

a second delta-processing module that applies the plurality of changes to the second materialized view from the second delta calculation module to the second materialized view (Figure 5A, diagrams 502, 504, and 506, Gupta).

Claim 7:

Regarding Claim 7, the combination of Sun in view of Gupta teaches wherein the plurality of entries in the refresh log correspond to a plurality of first materialized view entries in the first materialized view through a plurality of grouping identifiers that associate each of the plurality of entries with the plurality of first materialized view entries (Figure 2, all features, Gupta).

Claim 8:

Regarding Claim 8, Sun in view of Gupta teaches wherein a plurality of operators utilized by the first delta processing module to modify the first materialized view based upon the plurality of delta values (Figure 3A, all features, Gupta).

Claim 9:

Regarding Claim 9, the combination of Sun in view of Gupta teaches wherein the second delta calculation module is configured to calculate a plurality of second materialized view delta values from the plurality of changes and deliver the plurality of second materialized view delta values to the second delta processing module (Refer to claim 6, wherein these limitation are substantially the same/ or similar, Gupta).

Claim 10

Regarding Claim10, the combination of Sun in view of Gupta teaches wherein the second delta-processing module is configured to utilize the plurality of second materialized view delta values to apply the plurality of changes to the second materialized view (Refer to claim 6,wherein this limitation is substantially the same/or similar, Sun).

Claim 11:

Regarding Claim 11, the combination of Sun in view of Gupta teaches a system for performing a refresh operation, comprising:

means for deriving a first materialized view from at least one base table (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

means for accessing a refresh log and the first materialized view to perform the refresh operation on the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

means for calculating a plurality of delta values by combining a plurality of changes in the refresh log and a plurality of entries in the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

means for applying the plurality of delta values to the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun); and

means for providing the plurality of delta values to a delta adaptation module for refreshing a second materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun).

Claim 12:

Regarding Claim12, the combination of Sun in view of Gupta teaches a method of performing a refresh operation, the method comprising:

deriving a first materialized view from a base table (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

obtaining a refresh log and the first materialized view to perform the refresh operation on the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

calculating a plurality of delta values by combining a plurality of changes in the refresh log and a plurality of entries in the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun);

applying the plurality of delta values to the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun); and

providing the plurality of delta values to a delta adaptation module for refreshing a second materialized view derived from the first materialized view (Refer to claim 1, wherein this limitation substantially the same/or similar, Sun).

Claim 13:

Regarding Claim 13, the combination of Sun in view of Gupta teaches wherein obtaining and calculating are performed in a database management system ("DBMS") (column 5, lines 6-9, Sun).

Claim 14:

Regarding Claim 14, the combination of Sun in view of Gupta teaches wherein applying the plurality of delta values comprises utilizing a plurality of operators to modify the first materialized view (column 8, lines 58-60, Sun).

Claim 15:

Regarding Claim 15, the combination of Sun in view of Gupta teaches wherein the plurality of delta values to a delta processing module that applies the plurality of delta values to the first materialized view (see abstract, wherein the primary key values of the modified rows are recorded in a master log, wherein in response to a fresh command differences between the master table and snapshot are reconciled based on primary key values stored in the master table, the master log, and the snapshot, Sun).

Claim 16:

Regarding Claim 16, the combination of Sun in view of Gupta teaches wherein processing the plurality of delta values in the delta adaptation module to create a plurality of second materialized view changes for the second materialized view (Figures 7A and 7B, wherein diagram 710 illustrates updateable snapshot log, and wherein 7B, diagram 710 illustrates snapshot log which is equivalent to a delta adaptation module, wherein OLD$$ indicates a primary key value is old or new, MOD$$, indicates insert, delete, update, and TIME$$ illustrates a refresh timestamp, and CID and TIME$$, are already created, see diagram 210, Figures 2A,B,

and C, in which CID is equivalent to the group identifier; column 8, lines 65-67, wherein updateable snapshot of Figure 7b is the result of adding a new customer with a CID of 5 and a ZIP of 22046 to updateable snapshot, which is equivalent to creating a plurality of second materialized view changes, Sun) ;

calculating a plurality of second materialized view delta values that represent the plurality of second materialized view changes to be applied to the second materialized view (column 9, lines 1-6, Sun); and

applying the plurality of second materialized view changes to the second materialized view (Figure 7C, all features, wherein MOD$$ illustrates insert, i.e. I, and delete, i.e. D, with CID's 5 and 2, in which it is associated with diagram 700 within 7C, wherein CID 2 is deleted from diagram 700 in Figure 7C and wherein Figure 7B, CID 5 is requested to be inserted by the MOD$$, wherein it is shown in Figure 7C, that it was inserted, in which a change was made, and viewed. Sun).

Claim 17:

Regarding Claim 17, the combination of Sun in view of Gupta teaches wherein combining a tuple table with the plurality of delta values and projecting the plurality of second materialized view changes based upon the tuple table and the plurality of delta values (column 4, lines 8-17, wherein a primary key is a set of columns in a table having a combined value that is unique and non-null within a table, wherein a primary key value us able to uniquely identify each row in the table, and wherein since rows are uniquely identified by primary key values the fast refresh mechanism, employs primary keys, wherein the primary key values of modified rows of a

master table are recorded in a master log, Sun)

Claim18:

Regarding Claim 18, the combination of Sun in view of Gupta teaches wherein calculating the plurality of second materialized view delta values that represent the plurality of second materialized view changes to be applied to the second materialized view does not involve accessing a refresh log for the second materialized view (column 6, lines 27-31, Gupta).

Claim 19:

Regarding Claim 19, the combination of Sun in view of Gupta teaches wherein the method is performed in the recited order (column 14, lines 49-51, Gupta).

Claim 20:

Regarding Claim 20, the combination of Sun in view of Gupta teaches a computer program, comprising:

a machine-readable medium (column 3, lines 59-65, Sun);

a refresh log stored on the machine readable medium, the refresh log containing a plurality of change entries (Refer to claim 1, wherein this limitation is substantially the same/or similar, Sun); and

a refresh manager stored on the machine readable medium, the refresh manager being adapted to refresh a first materialized view derived at least in part from a base table by computing a plurality of delta values in a delta calculation module based on the refresh log (Refer to claim 6, wherein this limitation is substantially the same/or similar, Gupta) and the first materialized view, applying the plurality of delta values in a delta processing module to the first materialized view (Refer to claim 1, wherein this limitation is substantially the same/or similar,

Sun), and providing the plurality of delta values to a delta adaptation module derived from the first materialized view)Refer to claim 1, wherein this limitation is substantially the same/or similar, Sun).

Claim 21:

Regarding Claim 21, the combination of Sun in view of Gupta teaches wherein each of the plurality of change entries comprises a group identifier (column 16, lines 12-16, wherein rows are grouped by customer_id and region, Gupta).

Claim 22:

Regarding Claim 22, the combination of Sun in view of Gupta teaches wherein the delta calculation module combines the plurality of change entries and a plurality of entries in the first materialized view to create the plurality of delta values (column 12, lines 3-10, Gupta).

Prior Art of Record

1. Sun et al (US Patent No. 5,963,959) discloses a method and apparatus employs primary key values stored in a master table to drive a fast refresh mechanism for a snapshot defined on the master table.

2. Gupta et al (US Patent No. 7,111,020) discloses techniques for improving efficiency of database systems, and refreshing materialized views by the database system and rewriting queries to access the maintained views.

3. Arora (US Patent No. 6,708,179) discloses a framework for the incrementally refreshing a materialized view.

4. Lawande et al. (US Patent No. 6,882,993) discloses a method for incrementally refreshing a materialized view after multiple operations on a row of a base table of the materialized view by determining an equivalent operation and refreshing the materialized view according to the equivalent operation.

Point of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helene Rose whose telephone number is (571) 272-0749. The examiner can normally be reached on 8:00am - 4:30pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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September 27, 2006

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